AF/2115

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: **Aguilar et al.**

Serial No.: **09/527,398**

Filed: **March 16, 2000**

For: **Method and Apparatus for Updating Boot Code in a Data Processing System on a Local Storage Device**

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PATENT TRADEMARK OFFICE
CUSTOMER NUMBER

§ Group Art Unit: **2115**
§
§ Examiner: **Suryawanshi, Suresh**
§
§ Attorney Docket No.: **AUS000147US1**
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By: Michele Morrow
Michele Morrow

TRANSMITTAL DOCUMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:
ENCLOSED HEREWITH:

- Appellant's Brief (in triplicate) (37 C.F.R. 1.192); and
- Petition for Extension of Time within the First Month;
- Check in the amount of $110.00; and
- Our return postcard.

A fee of $330.00 is required for filing an Appellant's Brief. Please charge this fee to IBM Corporation Deposit Account No. 50-0563. No additional fees are believed to be necessary. If, however, any additional fees are required, I authorize the Commissioner to charge these fees which may be required to IBM Corporation Deposit Account No. 50-0563. A one-month extension of time is believed to be necessary and a check in the amount of $110.00 is enclosed. No additional extension of time is believed to be necessary. If, however, an additional extension of time is required, the extension is requested, and I authorize the Commissioner to charge any fees for this extension to IBM Corporation Deposit Account No. 50-0563.

Respectfully submitted,

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#16 pam 52604

Docket No. AUS000147US1 *PATENT*

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In re application of: **Aguilar et al.**

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For: **Method and Apparatus for Updating Boot Code in a Data Processing System on a Local Storage Device**

Group Art Unit: **2115**

Examiner: **Suryawanshi, Suresh**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

ATTENTION: Board of Patent Appeals and Interferences

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By: Michele Morrow
Michele Morrow

APPELLANT'S BRIEF (37 C.F.R. 1.192)

This brief is in furtherance of the Notice of Appeal, filed in this case on February 17, 2004.

The fees required under § 1.17(c), and any required petition for extension of time for filing this brief and fees therefore, are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This brief is transmitted in triplicate. (37 C.F.R. 1.192(a))

REAL PARTIES IN INTEREST

The real party in interest in this appeal is the following party: International Business Machines Corporation.

RELATED APPEALS AND INTERFERENCES

With respect to other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in the pending appeal, there are no such appeals or interferences.

STATUS OF CLAIMS

A. TOTAL NUMBER OF CLAIMS IN APPLICATION

Claims in the application are: 1-38

B. STATUS OF ALL THE CLAIMS IN APPLICATION

1. Claims canceled: NONE
2. Claims withdrawn from consideration but not canceled: NONE
3. Claims pending: 1-38
4. Claims allowed: NONE
5. Claims rejected: 1-38

C. CLAIMS ON APPEAL

The claims on appeal are: 1-38.

STATUS OF AMENDMENTS

There are no amendments after final rejection.

SUMMARY OF INVENTION

The present invention provides a method and apparatus for updating a current boot code in a data processing system in which the current boot code is used to load an operating system from a storage device. (Specification, page 8, line 31 to page 9, line 2) The storage device is searched for an updated boot code for the operating system in response to starting the data processing system. (Specification, page 9, lines 3-9) The current boot code is updated prior to loading the operating system for the data processing system if the updated boot code is present in the storage device. (Specification, page 12, line 13 to page 13, line 20)

ISSUES

The only issue on appeal is whether claims 1-38 are anticipated under 35 U.S.C. § 102(e) based on Huh et al. (U.S. Patent No. 6,584,559 B1).

GROUPING OF CLAIMS

The claims do not stand or fall together. The claims stand or fall in accordance with the following grouping of claims, the reasons for the following groupings being provided in the following arguments:

Group I - claims 1-4, 10, 12, 14, 15, 20-26, 32, 34 and 36-38;
Group II - claims 5 and 27;
Group III - claims 6 and 28;
Group IV - claims 7 and 29;
Group V - claims 8 and 30;
Group VI - claims 9 and 31;

Group VII - claims 11 and 33;

Group VIII - claims 13 and 35;

Group IX - claim 16;

Group X - claim 17;

Group XI - claim 18; and

Group XII - claim 19.

ARGUMENT

The Final Office Action rejects claims 1-38 under 35 U.S.C. § 102(e) as being anticipated by Huh et al. (U.S. Patent No. 6,584,559 B1). This rejection is respectfully traversed.

Appellants respectfully submits that, contrary to the allegations made in the Final Office Action, the Huh reference does not, in fact, teach searching a storage device for an updated boot code for the operating system in response to initiating the boot sequence, and updating the current boot code in the non-volatile memory prior to loading the operating system for the data processing system if the updated boot code is present, as recited in independent claims 1, 10, 15, 23, 32, 37 and 38.

I. 35 U.S.C. § 102, Alleged Anticipation of Group I-XII – Claims 1-4, 10, 12, 14, 15, 20-26, 32, 34 and 36-38

Claim 1, which is representative of independent claims 10, 15, 23, 32, 37 and 38 with regard to similarly recited subject matter, reads as follows:

> 1. A method for updating a current boot code in a data processing system in which the current boot code is used to load an operating system, the method comprising the data processing system implemented steps of:
>
> loading a current boot code from a non-volatile memory;
>
> initiating a boot sequence using the current boot code;
>
> searching a storage device for an updated boot code for the operating system in response to initiating the boot sequence; and
>
> updating the current boot code in the non-volatile memory prior to loading the operating system for the data processing system if the updated boot code is present.

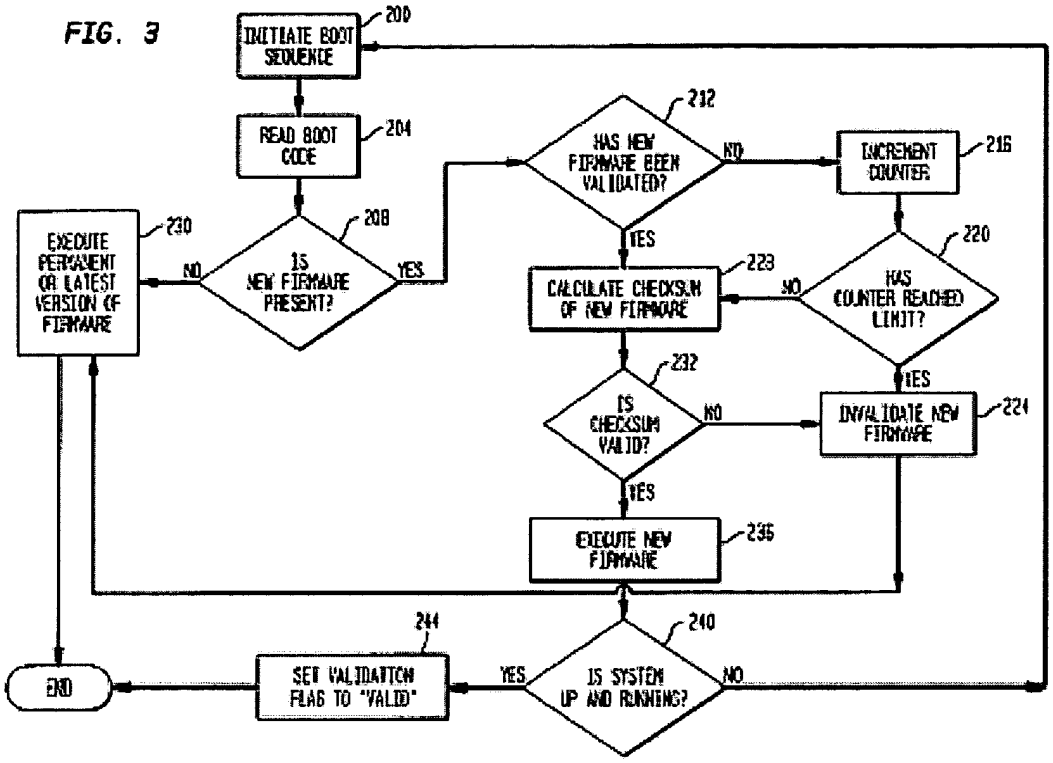
Appellants respectfully submit that Huh does not teach searching a storage device for an updated boot code for the operating system in response to initiating the boot sequence. Furthermore, Appellants respectfully submit that Huh does not teach updating the current boot code in the non-volatile memory prior to loading the operating system for the data processing system if the updated boot code is present. Huh teaches a method for programming a permanent version of firmware in ROM and employs a validation scheme for downloaded firmware. The downloaded firmware is executed when the validation scheme successfully validates the firmware. In the event that the downloaded firmware fails to download successfully or bring up the system, the processor is able to complete the booting process using the permanent or most recently validated version of firmware.

In response to the argument that Huh does not teach searching a storage device for an updated boot code for the operating system in response to initiating the boot sequence, the Final Office Action, on page 3, states:

> Huh clearly discloses for looking whether any new firmware is present to upgrade or replace the old firmware [col. 4, lines 24-30] and also expressly teaches that the new firmware is typically stored on writeable, archival media [col. 3, lines 38-40]. Plus, the new firmware can be loaded from a disk or uploaded or downloaded from another computational component [col. 3, lines 44-46]. Therefore, as shown in fig. 3, the decision box "IS NEW FIRMWARE PRESENT?" clearly indicates of a search process.

Appellants agree that Huh searches for an updated firmware. However, the present invention searches for new boot code that will be used to initiate the boot sequence. In contradistinction, Figure 3 of the Huh reference is shown as follows:

FIG. 3



This Figure of Huh teaches that once the boot sequence is initiated, the processor reads the permanent boot code. The boot code directs the processor to read any new firmware as part of the boot sequence, which requires the processor to determine whether any new firmware is present to upgrade or replace the old firmware. Thus, Huh teaches searching for a firmware update after the boot code has already directed the processor to look for a firmware update and does not teach searching a storage device for an updated boot code for the operating system in response to initiating the boot sequence.

Additionally, in response to the argument that Huh does not teach updating the current boot code in the non-volatile memory prior to loading the operating system for the data processing system if the updated boot code is present, the Final Office Action, on page 3, states:

> Huh discloses that the boot code as whole comprises of one permanent initial boot initiating part [fig. 1, boot code 42] and second upgradeable or changeable part [fig. 1, firmware 54]. Firmware is an ordered set of instructions and/or data that is used in booting a computational system [col. 1, lines 16-17]. Huh expressly discloses that this permanent boot code directs the processor to read any new firmware as part of the boot sequence, which requires the processor to determine whether any new firmware is present to upgrade or replace the old firmware [col. 4, lines 24-30].

Appellants agree with the Examiner that Huh teaches a boot code 42 separate from the firmware 54. However, Huh clearly distinguishes between boot code 42, old firmware 46 and new firmware 54 as separate and distinct elements. Nowhere, does huh suggest that firmware 54 is part of the boot code, as alleged by the Office Action.

Huh teaches that if the processor detects that no new firmware is present, the processor executes the old firmware and completes the booting process using the old firmware. If new firmware is present, the processor determines whether or not the new firmware has been previously validated. If the firmware has not been validated, the processor increments a counter. The validation flag indicates whether the validator is pending, successful (valid) or unsuccessful (invalid). The counter determines the number of attempts to validate the new firmware. The processor next determines whether the counter has reached a predetermined limit or threshold. When the counter is the same as the predetermined limit (or the number of unsuccessful validation attempts equals a predetermined number), the new firmware is invalidated and the validation flag is set to "INVALID". The processor next reads and executes the old (or latest) version of firmware. If the counter is less than the predetermined threshold, the processor continues to box. If the firmware has been validated previously, the processor calculates the checksum of the new firmware and thereafter determines whether the checksum is valid. If the checksum is invalid (or the firmware is invalid), the processor invalidates the new firmware and reads and executes the old (or latest) version of firmware to complete the boot operation.

Thus, the Huh reference teaches a process where the processor checks and validates new firmware after the boot code directs the processor to determine whether any new firmware is present to upgrade or replace the old firmware. In the event that after executing the new firmware the system is not running, the system reboots, reads the permanent boot code (element 42) and starts the firmware test process again. Thus, Huh teaches updating only firmware and does not teach updating the current boot code in the non-volatile memory prior to loading the operating system for the data processing system if the updated boot code is present.

Independent claims 10, 15, 32 and 38 recite subject features in their respective claim terminology. Claim 10, which is representative of independent claims 32 and 38, recites "searching, by the current boot code, for an updated boot code prior to loading the operating system, determining, by the current boot code, whether the updated boot code is a later version of the current boot code, and updating the current boot code using the updated boot code responsive to

the updated boot code being a later version of the current boot code." Claim 15, recites "a processor unit connected to the bus, wherein the processor unit executes the current boot code instructions to determine whether updated boot code instructions are present in the second storage device, updates the current boot code instructions using the updated boot code instructions to form an updated set of boot code instructions if the updated boot code instructions are present on the second storage device, reinitializes the data processing system using the updated set of boot code instructions if the current boot code instructions are updated, and loads the operating system using the updated set of boot code instructions."

Thus, in view of the above, Appellants respectfully submit that Huh does not teach each and every feature of independent claims 1, 10, 15, 23, 32, 37 and 38 as is required under 35 U.S.C. § 102(e). At least by virtue of their dependency on claims 1, 10, 15, 23 and 32, Huh does not teach each and every feature of dependent claims 2-4, 12, 14, 20-22, 24-26, 34 and 36. Accordingly, Appellants respectfully submit that the rejection of claims 1-4, 10, 12, 14, 15, 20-26, 32, 34 and 36-38 under 35 U.S.C. § 102(e) should be overturned.

II. 35 U.S.C. § 102, Alleged Anticipation of Group II – Claims 5 and 27

In addition to the above, with regard to claims 5 and 27, Huh does not teach loading the operating system using the current boot code if the updated boot code is absent. In the Huh reference, there is only one boot code, element 42. As discussed above, Huh teaches using permanent firmware of the latest version of firmware; however, that is only after the boot code has been read and the processor has been directed by the boot code to check for new firmware. Since the Huh reference fails to teach each and every claim limitation, the features of claims 5 and 27 are not anticipated by the Huh reference.

III. 35 U.S.C. § 102, Alleged Anticipation of Group III – Claims 6 and 28

In addition to the above, with regard to claims 6 and 28, Huh does not teach replacing the current boot code with the updated boot code prior to loading the operating system. As discussed above, Huh teaches replacing firmware and further teaches that the boot code is permanent. Nowhere in the Huh reference is replacing boot code taught. Since the Huh reference fails to teach

each and every claim limitation, the features of claims 6 and 28 are not anticipated by the Huh reference.

IV. 35 U.S.C. § 102, Alleged Anticipation of Group IV – Claims 7 and 29

In addition to the above, with regard to claims 7 and 29, Huh does not teach restarting the data processing system using the new current boot code and loading the operating system using the new current boot code. Huh teaches that the system is only restarted if the new firmware is not validated and then the processor reads the permanent boot code (element 42), which directs the processor to read the old firmware (element 46). Since the Huh reference fails to teach each and every claim limitation, the features of claims 7 and 29 are not anticipated by the Huh reference.

In response to the Examiners statement, that it is inherent in the system to do so otherwise there will be no effect of the upgraded code, Appellants respectfully disagree that there is an "inherent" means to restart the data processing system using the new current boot code. That is, in the Huh reference the same boot code will be used each time the system is rebooted, as there is no new boot code for the Huh system to use.

In response to the Examiners statement, that it is inherent in the system as loading of an operating system does not start until the boot-up procedure completes, Appellants respectfully disagree that there is an "inherent" means to load the operating system using the new current boot code. That is, in the Huh reference the same boot code will be used each time the system is rebooted, as there is no new boot code for the Huh system to use.

V. 35 U.S.C. § 102, Alleged Anticipation of Group V – Claims 8 and 30

In addition to the above, with regard to claims 8 and 30, Huh does not teach the updated boot code is present if a boot code is present on the storage device in which the boot code is a later version of the current boot code. As discussed above, there is only one boot code (element 42) and Huh teaches two versions of firmware; a new version (element 54) and an old version (element 46), thus, Huh does not teach an updated boot code. Since the Huh reference fails to teach each and every claim limitation, the features of claims 8 and 30 are not anticipated by the Huh reference.

VI. 35 U.S.C. § 102, Alleged Anticipation of Group VI – Claims 9 and 31

In addition to the above, with regard to claims 9 and 31, Huh does not teach wherein the updated boot code is present if a boot code is located on the storage device. As discussed above, there is only one boot code (element 42) and Huh teaches two versions of firmware; a new version (element 54) and an old version (element 46), thus, Huh does not teach an updated boot code. Since the Huh reference fails to teach each and every claim limitation, the features of claims 9 and 31 are not anticipated by the Huh reference.

VII. 35 U.S.C. § 102, Alleged Anticipation of Group VII – Claims 11 and 33

In addition to the above, with regard to claims 11 and 33, Huh does not teach searching a local storage device for the updated boot code prior to loading the operating system. In the Huh reference there is only one boot code, element 42. As discussed above, Huh teaches searching for new firmware. Huh simply is not concerned with updating the boot code or searching for updated boot code. Since the Huh reference fails to teach each and every claim limitation, the features of claims 11 and 33 are not anticipated by the Huh reference.

VIII. 35 U.S.C. § 102, Alleged Anticipation of Group VIII – Claims 13 and 35

In addition to the above, with regard to claims 13 and 35, Huh does not teach searching a storage device located remotely to the data processing system for the updated boot code prior to loading the operating system. In the Huh reference there is only one boot code, element 42. As discussed above, Huh teaches searching for new firmware. Huh simply is not concerned with updating the boot code or searching for updated boot code. Since the Huh reference fails to teach each and every claim limitation, the features of claims 13 and 35 are not anticipated by the Huh reference.

IX. 35 U.S.C. § 102, Alleged Anticipation of Group IX – Claim 16

In addition to the above, with regard to claim 16, Huh does not teach updating of the current boot code instructions is performed by replacing the current boot code instructions in the first storage device with the updated boot code instructions in the second storage device. In the Huh reference there is only one boot code, element 42. As discussed above, Huh teaches updating the old firmware (element 46) with the new firmware (element 54). Huh simply is not concerned with updating the boot code or searching for updated boot code. Since the Huh reference fails to teach each and every claim limitation, the features of claim 16 are not anticipated by the Huh reference.

X. 35 U.S.C. § 102, Alleged Anticipation of Group X – Claim 17

In addition to the above, with regard to claim 17, Huh does not teach a processor unit that loads the operating system using the current boot code instructions if updated boot code instructions are absent on the second storage device. In the Huh reference there is only one boot code, element 42. As discussed above, Huh simply is not concerned with updating the boot code or searching for updated boot code. Since the Huh reference fails to teach each and every claim limitation, the features of claim 17 are not anticipated by the Huh reference.

In response to the Examiners statement, that it is inherent in any computer system as loading of the operating system does not start until the boot-up procedure completes, Appellants respectfully disagree that there is an "inherent" means for a processor unit that loads the operating system using the current boot code instructions if updated boot code instructions are absent on the second storage device. That is, in the Huh reference the same boot code will be used every time the system is rebooted, as there is no updated boot code for the Huh system to use.

XI. 35 U.S.C. § 102, Alleged Anticipation of Group XI – Claim 18

In addition to the above, with regard to claim 18, Huh does not teach updated boot code instructions are present if any boot code instructions are present on the second storage device. In the Huh reference there is only one boot code, element 42. As discussed above, Huh simply is not concerned with updating the boot code or searching for updated boot code. Since the Huh reference

fails to teach each and every claim limitation, the features of claim 18 are not anticipated by the Huh reference.

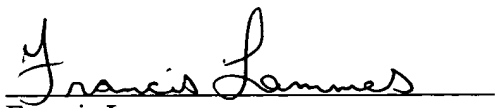
XII. 35 U.S.C. § 102, Alleged Anticipation of Group XII – Claim 19

In addition to the above, with regard to claim 19, Huh does not teach updated boot code instructions are present if a newer version of the current boot code instructions is present. In the Huh reference there is only one boot code, element 42. As discussed above, Huh simply is not concerned with updating the boot code or searching for updated boot code. Since the Huh reference fails to teach each and every claim limitation, the features of claim 19 are not anticipated by the Huh reference.

CONCLUSION

In view of the above, Appellants respectfully submit that claims 1-38 are allowable over the cited prior art and that the application is in condition for allowance. Accordingly, Appellant respectfully requests the Board of Patent Appeals and Interferences to not sustain the rejections set forth in the Final Office Action.

Respectfully submitted,



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APPENDIX OF CLAIMS

The text of the claims involved in the appeal are:

1. A method for updating a current boot code in a data processing system in which the current boot code is used to load an operating system, the method comprising the data processing system implemented steps of:

loading a current boot code from a non-volatile memory;

initiating a boot sequence using the current boot code;

searching a storage device for an updated boot code for the operating system in response to initiating the boot sequence; and

updating the current boot code in the non-volatile memory prior to loading the operating system for the data processing system if the updated boot code is present.

2. The method of claim 1, wherein the storage device is a non-volatile random access memory.

3. The method of claim 1, wherein the operating system is stored on the storage device.

4. The method of claim 3, wherein the storage device is a removable storage device locally connected to the data processing system.

5. The method of claim 1 further comprising:

loading the operating system using the current boot code if the updated boot code is absent.

6. The method of claim 1, wherein the updating step comprises:

replacing the current boot code with the updated boot code prior to loading the operating system.

7. The method of claim 1, wherein the updating step forms a new current boot code and further comprises:

restarting the data processing system using the new current boot code; and

loading the operating system using the new current boot code.

8. The method of claim 1, wherein the updated boot code is present if a boot code is present on the storage device in which the boot code is a later version of the current boot code.

9. The method of claim 1, wherein the updated boot code is present if a boot code is located on the storage device.

10. A method in a data processing system for loading an operating system using a boot code, the method comprising:

loading a current boot code;

searching, by the current boot code, for an updated boot code prior to loading the operating system;

determining, by the current boot code, whether the updated boot code is a later version of the current boot code; and

updating the current boot code using the updated boot code responsive to the updated boot code being a later version of the current boot code.

11. The method of claim 10, wherein the searching step comprises:

searching a local storage device for the updated boot code prior to loading the operating system.

12. The method of claim 11, wherein the local storage device contains the operating system.

13. The method of claim 10, wherein the searching step comprises:

searching a storage device located remotely to the data processing system for the updated boot code prior to loading the operating system.

14. The method of claim 13, wherein the storage device is located on a server.

15. A data processing system comprising:

a bus;

a first storage device connected to the bus, wherein the first storage device includes current boot code instructions;

a second storage device connected to the bus, wherein an operating system is located on the second storage device; and

a processor unit connected to the bus, wherein the processor unit executes the current boot code instructions to determine whether updated boot code instructions are present in the second storage device, updates the current boot code instructions using the updated boot code instructions to form an updated set of boot code instructions if the updated boot code instructions are present on the second storage device, reinitializes the data processing system using the updated set of boot code instructions if the current boot code instructions are updated, and loads the operating system using the updated set of boot code instructions.

16. The data processing system of claim 15, wherein updating of the current boot code instructions is performed by replacing the current boot code instructions in the first storage device with the updated boot code instructions in the second storage device.

17. The data processing system of claim 15, wherein the processor unit loads the operating system using the current boot code instructions if updated boot code instructions are absent on the second storage device.

18. The data processing system of claim 17, wherein the updated boot code instructions are present if any boot code instructions are present on the second storage device.

19. The data processing system of claim 17, wherein the updated boot code instructions are present if a newer version of the current boot code instructions is present.

20. The data processing system of claim 15, wherein the first storage device is a non- volatile random access memory.

21. The data processing system of claim 15, wherein the second storage device is one of a removable non-volatile random access memory, a hard disk drive, a floppy disk, a CD-ROM, and a DVD-ROM.

22. The data processing system of claim 15, wherein the data processing system is one of a laptop computer, a palmtop computer, a personal computer, and a personal digital assistant.

23. A data processing system for updating a current boot code in which the current boot code is used to load an operating system, the data processing system comprising:

loading means for loading a current boot code from a non-volatile memory;

initiating means for initiating a boot sequence using the current boot code;

searching means for searching a storage device for an updated boot code for the operating system in response to initiating the boot sequence; and

updating means for updating the current boot code in the non-volatile memory prior to loading the operating system for the data processing system if the updated boot code is present.

24. The data processing system of claim 23, wherein the storage device is a non-volatile random access memory.

25. The data processing system of claim 23, wherein the operating system is stored on the storage device.

26. The data processing system of claim 25, wherein the storage device is a removable storage device locally connected to the data processing system.

27. The data processing system of claim 23 further comprising:

loading means for loading the operating system using the current boot code if the updated boot code is absent.

28. The data processing system of claim 23, wherein the updating means comprises:

replacing means for replacing the current boot code with the updated boot code prior to loading the operating system.

29. The data processing system of claim 23, wherein the updating means generates a new current boot code and further comprises:

restarting means for restarting the data processing system using the new current boot code; and

loading means for loading the operating system using the new current boot code.

30. The data processing system of claim 23, wherein the updated boot code is present if a boot code is present on the storage device in which the boot code is a later version of the current boot code.

31. The data processing system of claim 23, wherein the updated boot code is present if a boot code is located on the storage device.

32. A data processing system for loading an operating system using a boot code, the data processing system comprising:

loading means for loading a current boot code;

searching means for searching, by the current boot code, for an updated boot code prior to loading the operating system;

determining means for determining, by the current boot code, whether the updated boot code is a later version of the current boot code; and

updating means for updating the current boot code using the updated boot code responsive to the updated boot code being a later version of the current boot code.

33. The data processing system of claim 32, wherein the searching means comprises:

means for searching a local storage device for the updated boot code prior to loading the operating system.

34. The data processing system of claim 33, wherein the local storage device contains the operating system.

35. The data processing system of claim 32, wherein the searching means comprises:

means for searching a storage device located remotely to the data processing system for the updated boot code prior to loading the operating system.

36. The data processing system of claim 35, wherein the storage device is located on a server.

37. A computer program product in a computer readable medium for updating a current boot code in a data processing system in which the current boot code is used to load an operating system, the computer program product comprising:

first instructions for loading a current boot code from a non-volatile memory;

second instructions for initiating a boot sequence using the current boot code;

third instructions for searching a storage device for an updated boot code for the operating system in response to initiating the boot sequence; and

fourth instructions for updating the current boot code in the non-volatile memory prior to loading the operating system for the data processing system if the updated boot code is present.

38. A computer program product in a computer readable medium for loading an operating system using a boot code, the computer program product comprising:

first instructions for loading a current boot code;

second instructions for searching, by the current boot code, for an updated boot code prior to loading the operating system;

third instructions for determining, by the current boot code, whether the updated boot code is a later version of the current boot code;

fourth instructions for updating the current boot code using the updated boot code responsive to the updated boot code being a later version of the current boot code.